

**REMARKS**

Reconsideration and withdrawal of the rejections of the Office Action is respectfully requested in view of the remarks, amendments and enclosures herewith. Examiner Vincent is again thanked for the courtesies extended during the December 8, 2004 telephonic interview.

**I. STATUS OF THE CLAIMS AND FORMAL MATTERS**

Claims 29-56 are now pending. Claim 51 has been amended, without prejudice, without admission, and without surrender of subject matter.

No new matter is added.

It is respectfully submitted that the claims, as originally presented and as herein presented, are patentably distinct over the prior art cited by the Examiner, and that these claims are and were in full compliance with the requirements of 35 U.S.C. §112. The amendments to the claims presented herein, are not made for the purpose of patentability within the meaning of 35 U.S.C. §§ 101, 102, 103 or 112. Rather, these amendments are made to set forth previously dependent claim 51 in independent form.

**II. THE ART REJECTIONS ARE OVERCOME**

Claims 29-50 and 52-56 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Choy et al (WO 97/21848) in view of Blackwell et al (US 6312656). Claim 51 is rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Choy et al. and Blackwell et al. as applied to claim 45, and further in view of Japan 62-220376 (see abstract and figures). The rejections are respectfully traversed.

Initially, Applicants respectfully assert that in order to ground an obviousness rejection, there must be some teaching which would have provided the necessary incentive or motivation for modifying the reference's teaching. *In re Laskowski*, 12 U.S.P.Q. 2d 1397, 1399 (Fed. Cir. 1989); *In re Obukowitz*, 27 U.S.P.Q. 2d 1063 (B.P.A.I. 1993). Further, "obvious to try" is not the standard under 35 U.S.C. §103. *In re Fine*, 5 U.S.P.Q. 2d 1596, 1599 (Fed. Cir. 1988). And as stated by the Court in *In re Fritch*, 23 U.S.P.Q. 2d 1780, 1783-1784 (Fed. Cir. 1992): "The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggests the desirability of the modification." Also, the Examiner is respectfully reminded that for the Section 103 rejection to be proper, both

the suggestion of the claimed invention and the expectation of success must be founded in the prior art, and not Applicants' disclosure. *In re Dow*, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988).

It is respectfully submitted that the combination of Choy *et al.* and Blackwell *et al.* do not render the present invention obvious, i.e. Choy *et al.* and Blackwell *et al.* do not combine to provide methods of depositing material on a substrate, comprising the steps of delivering from a first outlet a stream of droplets of a precursor liquid towards a substrate; applying an electric field between the first outlet and the substrate; and delivering from a second outlet a flow of fuel about the stream of droplets such as to provide an annular flame combustion region between the first outlet and the substrate through which at least a portion of the stream of droplets passes before reaching the substrate, whereby the precursor liquid is chemically reacted, or decomposed, or chemically reacted and decomposed, to provide the deposited material.

The Office Action alleges that Choy *et al.* teaches apparatus and methods for depositing oxide or ceramic material on a substrate including delivering a stream of precursor droplets, applying an electric field between the droplet outlet and the substrate and heating the area between the outlet and the substrate to convert the droplets to deposited material, and Blackwell that the teachings in Blackwell *et al.* show that the flame is necessarily annular, although the Office Action admits that "Blackwell *et al.* does not state that the flame is annular, per se". Office Action at 3. Furthermore, the Office Action alleges that "[i]t would have been obvious ... to use the fuel/oxygen flame from Blackwell *et al.* as the heat source in Choy *et al.* because it would have been a functional equivalent to the heat source of Choy *et al.*". Office Action at 2. Applicants respectfully disagree with the assertions in the Office Action.

As was discussed during the December 8, 2004 telephonic interview, Applicants disagree with the Examiner's assertion that the flame in Blackwell must necessarily be annular.

The Examiner is of the view that "annular" is defined as ring-shaped, and applies the definition such that if a flame is at any point in the shape of a ring, regardless of whether the ring is the overall shape of the flame, would be considered annular. In considering the flame shown by Blackwell's Figure 4, initially the Examiner asserts that the flame shown in Figure 4 is "cartoonish" and that the figure cannot be relied upon to accurately reflect Blackwell's disclosure. Applicants respectfully submit that Figure 4, "cartoonish" or not, is a part of Blackwell's disclosure, and must be read with the same weight given to the text of Blackwell.

Applicants respectfully direct the Examiner's attention to attached Exhibit 1, which depicts Blackwell's Figure 4 having vectors drawn in the direction of the flow of fuel from channel 47. Applicants maintain that Figure 4 demonstrates a continuous flame across and/or above the burner face, and Exhibit 1 has been presented to show Figure 4 does not in any way describe an annular flame, rather, it shows a flame which converges upon itself, and therefore cannot be an annular flame.

Simply, the Examiner maintains that as the fuel flows through the outermost chambers 47, the flame will develop along the line in which the fuel is traveling, shown in Exhibit 1 by the arrows. This interpretation of Figure 4 is compounded by the Examiner's assertion that essentially the area under the arrows would be free of flames, and that as such an area has a ring shape at the burner face, the flame is necessarily annular. Again, Applicants disagree with this assertion.

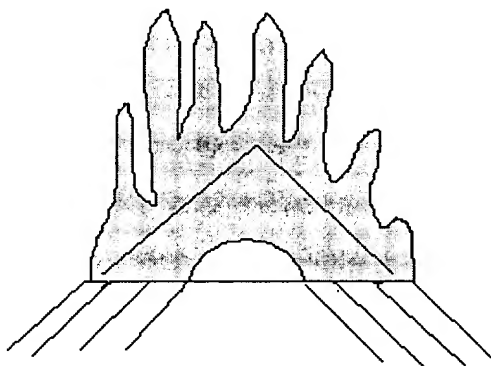
Regardless of how Figure 4 is interpreted, Applicants can not agree that this is a annular flame. Rather, the flame depicted by Exhibit 1, would be conical in shape, with the area that the fuel paths overlapped forming the tip of the cone. Simply, such a flame is not annular as it does not keep its shape. Rather, the diameter of the "ring" decreases until the ring disappears; and the ring disappears before the flame burns out, thereby providing a conical shape to the flame.

In contrast, a true annular flame would appear similar to the diagram entitled "Schematic of the Powder Flame Spray Process" as shown in Exhibit 2. Clearly, this diagram demonstrates a flame that remains on the outer portion of the ring only. The center of the flame is entirely open, with a flame-free portion throughout, thereby demonstrating a true-annular flame as opposed to the conical flame of Blackwell. The Examiner's attention is also drawn to the position of the channels in the diagram of Exhibit 2. As depicted in the figures of the present invention, the chambers through which the fuel flows are directed in a manner parallel to each other, such that as the fuel flows outward from the chambers it is not directed towards a point above the center of the burner face, as is the scenario evinced by Blackwell.

Furthermore, support for Applicants contention that an annular flame describes a flame that is cylindrical throughout its length is also found in the use of the word annular in other areas. For example, the annular rings on a tree form a cylinder the entire length of the tree. In addition, annular is used in the mining industry to describe the flow of fluid through pipes. Exhibit 3 provides a definition of annular flow, wherein two liquids with different weights flow

simultaneously through the same pipe, with the lighter fluid in the center, and the heavier fluid essentially forming a film on the wall of the pipe, such that the two fluids do not mix. In this instance again, each fluid essentially forms a cylinder throughout the length of the pipe.

The Examiner also relies on the presence of a “barrier gas” in Blackwell to show that the flame must be annular. Again, such a “barrier gas” would not create an annular flame, especially at low flow rates, and would instead create a situation as shown below:



wherein the shaded area represents the location of the flames, and the open space demonstrates the flame-free region created by the barrier gas. As depicted above, the use of a barrier gas does not imply or necessitate that the flame is annular.

Furthermore, Applicants again assert that the reference in Blackwell to use of a barrier gas in fact supports Applicants belief that the flame of Blackwell is, in fact, continuous. The purpose of delivering an inert gas through an inner channel, namely, inner channel (44), is expressly recited as being to “inhibit reaction of the liquid feedstock and soot build-up on burner face (53).” It is submitted that such inhibition at the burner face (53) is required for the very reason that the flame combustion region (23) extends thereover, as, otherwise, inhibition would be unnecessary, and, as such, and contrary to the Office Action’s allegation, this disclosure is not to the development of an annular flame combustion region (23).

Again, Applicants assert that the flame that would result from the device of Blackwell’s Figure 4 is not annular, and that for this reason the section 103 rejection must fail.

Claim 51 was also rejected as allegedly unpatenable over Choy in view of Blackwell and JP ‘376. The Office Action alleged that it would have been obvious to use the mesh electrode of JP ‘376 in the arrangement of Choy and Blackwell. Even if one of skill in the art was to

combine these references, the mesh electrode of JP '376 in combination with Choy and Blackwell would not result in the present invention.

Simply, in JP'376, the mesh electrode serves to create a corona discharge between two electrodes. In the present invention, the electric field is generated from high voltage source 45, and exists between the nozzle assembly 10 and substrate 50. The mesh of the present invention is not related to the presence of the electric field in any sense, and instead serves to "[assist] in removing soot from the flame". Specification at 3. Accordingly, none of Choy and or Blackwell, alone or in combination, including with the mesh electrode of JP '376 teach or suggest the present invention.

Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. §103 are respectfully requested in view of the remarks and enclosures herewith.

#### **REQUEST FOR INTERVIEW**

If any issue remains as an impediment to allowance, an interview with the Examiner and his supervisor, is respectfully requested, prior to issuance of any paper other than a Notice of Allowance; and, the Examiner is respectfully requested to contact the undersigned to arrange a mutually convenient time and manner for such an interview.

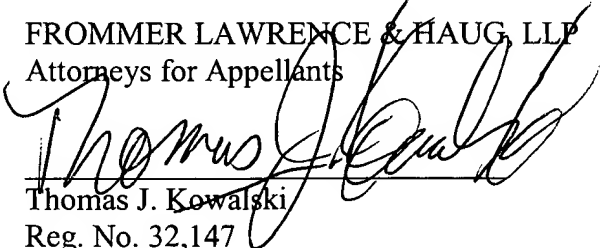
#### **CONCLUSION**

In light of the remarks and enclosures herewith, the application is in condition for allowance. Reconsideration and withdrawal of the rejections of the application, and prompt issuance of a Notice of Allowance, is respectfully requested.

Respectfully submitted,

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